General

Guideline Title

Screening for high blood pressure in adults: U.S. Preventive Services Task Force recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for high blood pressure in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2015 Nov 17;163(10):778-86. [59 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force (USPSTF). Screening for high blood pressure: U.S. Preventive Services Task Force reaffirmation recommendation statement. Ann Intern Med. 2007 Dec 4; 140(11): 783-7. [6 references].

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the Levels of Certainty regarding Net Benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Summary of Recommendation and Evidence

The USPSTF recommends screening for high blood pressure in adults aged 18 years or older. (A recommendation)

The USPSTF recommends obtaining measurements outside of the clinical setting for diagnostic confirmation before starting treatment.

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to adults aged 18 years or older without known hypertension.

Screening Tests

Office Blood Pressure Measurement

Office measurement of blood pressure is most commonly done with a manual or automated sphygmomanometer. Little research has been done on the best approach to measuring blood pressure in the office setting. Most clinical trials of hypertension treatment, at a minimum, used the mean of 2 measurements taken while the patient was seated (some used the mean of the second and third measurements), allowed for at least 5 minutes between entry into the office and blood pressure measurement, used an appropriately sized arm cuff, and placed the patient's arm at the level of the right atrium during measurement. Multiple measurements over time have better positive predictive value for hypertension than a single measurement. Automated office blood pressure, which is an average of multiple automated measurements taken while the patient is alone in a room, may yield results similar to those of daytime ambulatory blood pressure monitoring (ABPM). Blood pressure is affected by various short-term factors, such as emotions, stress, pain, physical activity, and drugs (including caffeine and nicotine). In addition to within-patient temporal variability, isolated clinic hypertension in the medical setting and in the presence of medical personnel (known as "white coat" hypertension) is well-documented. Epidemiologic data suggest that 15% to 30% of the population believed to have hypertension may have lower blood pressure outside of the office setting. The disadvantages of diagnosing hypertension solely in the office setting include measurement errors, the limited number of measurements that can be made conveniently, and the confounding risk for isolated clinic hypertension.

Ambulatory and Home Blood Pressure Monitoring

In addition to office blood pressure measurement, ABPM and home blood pressure monitoring (HBPM) may be used to confirm a diagnosis of hypertension after initial screening. ABPM devices are small, portable machines that record blood pressure at regular intervals over 12 to 24 hours while patients go about their normal activities and while they are sleeping. Measurements are typically taken at 20- to 30-minute intervals. HBPM devices are fully automated oscillometric devices that record measurements taken from the patient's brachial artery. Many of these devices are available for retail purchase, and some have undergone technical validation according to recommended protocols.

The USPSTF found convincing evidence that ABPM is the best method for diagnosing hypertension. Although the criteria for establishing hypertension varied across studies, there was significant discordance between the office diagnosis of hypertension and 12- and 24-hour average blood pressures using ABPM, with significantly fewer patients requiring treatment based on ABPM (see Figure 2 in the original guideline document). Elevated ambulatory systolic blood pressure was consistently and significantly associated with increased risk for fatal and nonfatal stroke and cardiovascular events, independent of office blood pressure (see Figure 3 in the original guideline document). For these reasons, the USPSTF recommends ABPM as the reference standard for confirming the diagnosis of hypertension.

Good-quality evidence suggests that confirmation of hypertension with HBPM may be acceptable. Several studies showed that elevated home blood pressure was significantly associated with increased risk for cardiovascular events, stroke, and all-cause mortality, independent of office blood pressure (see Figure 4 in the original guideline document). However, fewer studies have compared HBPM with office blood pressure measurement, so the evidence is not as substantial as it is for ABPM. Therefore, the USPSTF considers ABPM to be the reference standard for confirming the diagnosis of hypertension. However, the USPSTF acknowledges that the use of ABPM may be problematic in some situations. HBPM using appropriate protocols is an alternative method of confirmation if ABPM is not available. Measurements from the office, HBPM, and ABPM must be interpreted with care and in the context of the individual patient. Patients with very high blood pressure or signs of end-organ damage may need immediate treatment.

Screening Interval

The USPSTF recommends annual screening for adults aged 40 years or older and for those who are at increased risk for high blood pressure. Persons at increased risk include those who have high-normal blood pressure (130 to 139/85 to 89 mm Hg), those who are overweight or obese, and African Americans. Adults aged 18 to 39 years with normal blood pressure (<130/85 mm Hg) who do not have other risk factors should be rescreened every 3 to 5 years. The USPSTF recommends rescreening with properly measured office blood pressure and, if blood pressure is elevated, confirming the diagnosis of hypertension with ABPM.

Treatment

The benefits of treatment of hypertension in preventing important health outcomes are well documented. Moderate- to high-quality randomized controlled trials (RCTs) demonstrate the efficacy of treatment of the general population of persons aged 60 years or older to a target blood pressure of 150/90 mm Hg in reducing the incidence of stroke, heart failure, and coronary heart disease events. Similarly, RCTs demonstrate the efficacy of treatment of younger adults to a target diastolic blood pressure of less than 90 mm Hg in reducing cerebrovascular events, heart failure, and overall mortality. In the absence of sufficient RCT data, expert opinion has been used to establish a target systolic blood pressure of 140 mm Hg in adults younger than 60 years, and some experts believe that this should also be maintained in those aged 60 years or older. However, published results from a recently completed large RCT, the Systolic Blood Pressure Intervention Trial, are not yet available to inform current treatment goals. Clinicians should consult updated blood pressure treatment guidelines informed by this trial as they become available.

For nonblack patients, initial treatment consists of a thiazide diuretic, calcium-channel blocker, angiotensin-converting enzyme inhibitor, or angiotensin-receptor blocker. For black patients, initial treatment is thiazide or a calcium-channel blocker. Initial or add-on treatment for patients

with chronic kidney disease consists of either an angiotensin-converting enzyme inhibitor or an angiotensin-receptor blocker (not both).

Definitions

What the USPSTF Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies

Level of Certainty	Description
	• Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

High blood pressure (hypertension)

Guideline Category

Prevention

Screening

Clinical Specialty

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To summarize the current U.S. Preventive Services Task Force (USPSTF) recommendations on screening for high blood pressure in adults

Target Population

Adults aged 18 years or older without known hypertension

Interventions and Practices Considered

1. Screening for high blood pressure (ages 18 years and older)
2. Obtaining measurements outside the clinical setting for diagnostic confirmation

Major Outcomes Considered

- Key Question 1: Does screening for high blood pressure reduce cardiovascular disease and mortality in adults aged 18 years or older?
- Key Question 2: What is the best way to screen for high blood pressure in adults in the primary care setting?
    a. How accurate (i.e., sensitivity, specificity, and predictive value) are clinic-based blood pressure measurement methods (e.g., manual vs. automated) in provisionally diagnosing hypertension within a single visit?
    b. What screening protocol characteristics within a single encounter (e.g., sitting quietly for 5 minutes or number of readings) define the best diagnostic accuracy?
- Key Question 3: What is the best way to confirm hypertension in adults who initially screen positive for high blood pressure?
    a. How well do ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) methods predict cardiovascular events compared with clinic-based blood pressure measurement methods? What confirmation protocol characteristics define the best prediction of cardiovascular events? Which methods and associated protocols best predict cardiovascular events?
    b. How accurate are other noninvasive blood pressure measurement methods in establishing or confirming the diagnosis of hypertension compared with these best methods and associated protocols? Does diagnostic accuracy vary by protocol characteristics (i.e., characteristics not reviewed in key question 2b, such as the number of visits)?
    c. Does changing the measurement method from that used during the initial screening improve diagnostic accuracy for some specific patient subgroups (e.g., those with suspected white coat hypertension)?
- Key Question 4: What is the clinically appropriate rescreening interval for patients who have previously been screened and found to have normal blood pressure?
    a. What is the shortest interval in which clinically significant, diagnosed hypertension may develop?
    b. Does the rescreening interval vary by patient characteristics (e.g., age, sex, race/ethnicity, cardiovascular risk, blood pressure, or screening history)?
- Key Question 5: What are the adverse effects of screening for high blood pressure in adults?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Kaiser Permanente Research Affiliates Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Sources and Searches

The investigators searched MEDLINE, PubMed, the Cochrane Central Register of Controlled Trials, and CINAHL from 2003 through August 8, 2014 to update benefits and harms of screening for high blood pressure. EPC staff searched the same databases (excluding CINAHL) through February 24, 2014 as follows: starting in 1992 (to allow for implementation of the first guidelines for validation of blood pressure monitoring devices) for prediction of cardiovascular events by blood pressure method and diagnostic accuracy of nonoffice measurement, and starting in 1966 (the beginning of MEDLINE) for rescreening interval. On the basis of the findings from these updated searches, they did not further update them because any studies found would probably not have changed the overall conclusions. The investigators also searched bibliographies of relevant

reviews, included studies, and publication lists of highly referenced studies.

Study Selection

Two investigators independently reviewed abstracts and full-text articles against prespecified inclusion and exclusion criteria. They required all studies to have enrolled untreated adults and to have been conducted in countries rated as "very high" on the 2013 Human Development Index. For prediction of cardiovascular events, the investigators allowed studies that included treated patients because a proportion of persons followed over time would inevitably begin treatment. Ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) devices were eligible for use in confirming an initially elevated office blood pressure measurement result. For screening benefits and harms, cardiovascular events were analyzed and included fatal or nonfatal myocardial infarction; sudden cardiac death; stroke; heart failure; atrial fibrillation; transient ischemic attack; end-stage kidney disease; or a composite of any of the aforementioned events, excluding cardiovascular symptoms, angina, revascularization, carotid intima–media thickness, and left ventricular hypertrophy.

For diagnostic accuracy of office blood pressure measurement, the investigators included studies that compared different office-based devices or measurement protocols and reported sensitivity, specificity, predictive values, or concordance (for example, Ä¸). For diagnostic accuracy of confirmatory blood pressure measurement methods, eligible study populations had an initial elevated office blood pressure at screening, which allowed for reporting or calculation of the positive predictive value (PPV).

For prediction of cardiovascular events, eligible studies followed a cohort of patients over time and reported the associations (hazard or risk ratios) of blood pressure as a continuous variable, measured by at least 2 methods at baseline, with data on overall mortality or cardiovascular events collected during follow-up. For rescreening interval, the investigators included studies that followed cohorts of initially nonhypertensive adults over time and reported hypertension incidence at rescreening intervals of up to 6 years.

Number of Source Documents

The investigators reviewed 19,309 abstracts and 1,171 articles for possible inclusion. See the flow diagram (Appendix Figure 2) in the systematic review (see the "Availability of Companion Documents" field) for a summary of evidence search and selection.

Articles included for Key Questions:

- Key Question 1: 3 (1 study)
- Key Question 2a: 4 (4 studies)
- Key Question 2b: 3 (3 studies)
- Key Question 3a: 34 (15 studies)
- Key Question 3b: 42 (27 studies)
- Key Question 3c: 22 (13 studies)
- Key Question 4a: 58 (39 studies)
- Key Question 4b: 57 (39 studies)
- Key Question 5: 13 (9 studies)

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Two investigators independently assessed the quality of included studies by using predefined, design-specific criteria. They rated study quality as good, fair, or poor. See the "Description of the Methods Used to Analyze the Evidence" field for further information.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Kaiser Permanente Research Affiliates Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Extraction and Quality Assessment

One investigator abstracted data from all included studies, and a second checked for accuracy. Two investigators independently assessed the quality of included studies by using predefined, design-specific criteria. They rated study quality as good, fair, or poor and excluded all poor-quality studies. The investigators resolved disagreements about quality through discussion with a third investigator. Where reported, studies with various threats to internal validity were downgraded to fair-quality according to USPSTF standards.

Data Synthesis and Analysis

The investigators qualitatively described the results on the benefits and harms of screening. Per the protocol, they first calculated the diagnostic accuracy of office blood pressure measurement by using the recommendations of the American Heart Association as the reference standard because there is no gold standard for blood pressure measurement. With the subsequent identification of ambulatory blood pressure monitoring (ABPM) as the best predictor of cardiovascular events, they calculated the diagnostic accuracy of office blood pressure measurement and confirmatory blood pressure measurement methods by using ABPM as the reference standard where possible. The investigators qualitatively described all diagnostic accuracy results because data were insufficient for quantitative synthesis.

For prediction of cardiovascular events, the investigators combined fatal and nonfatal events within outcome categories (cardiovascular, stroke, and cardiac). Risk was most commonly reported as the hazard ratio associated with each 10–mm Hg increase in systolic blood pressure and each 5–mm Hg increase in diastolic blood pressure. They converted hazard ratios to these common increments if they were reported differently. The investigators depicted the hazard ratios in forest plots for qualitative evaluation; because of the small numbers of studies for each outcome and heterogeneity across studies, they did not calculate summary meta-analytic estimates of risk to determine the best blood pressure measurement method for prediction. The investigators conducted exploratory meta-analyses to compare ABPM protocols (24-hour, daytime, and nighttime) by generating estimates of cardiovascular events or mortality risk for each protocol by using the DerSimonian–Laird random effects method. In sensitivity analyses, these results were compared to estimates generated by using profile likelihood and Knapp–Hartung methods.

For rescreening, the investigators pooled reported incidence rates across all studies to generate a weighted mean incidence at yearly intervals (reported within ±0.5 year). They qualitatively examined within-study comparisons among a priori subgroups of age, blood pressure, sex, body mass index (BMI), smoking status, and race/ethnicity.

When constructing the overall summary of evidence (see Appendix Table 1 in the systematic review), the investigators evaluated included studies within the context of each review question for consistency of results for important outcomes and relevance to primary care.

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see Table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

**A*, *B*, *C*, *D*, and *I (Insufficient)* represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field).

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence, the Task Force constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the USPSTF process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term *certainty* will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is

"low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see the "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147:871-875. [5 references].

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
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C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence

Level of Certainty	Description
	As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Cost Analysis

The U.S. Preventive Services Task Force (USPSTF) does not consider the costs of providing a service in this assessment.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review

Before the U.S. Preventive Services Task Force (USPSTF) makes its final determinations about recommendations on a given preventive service, the Evidence-based Practice Center and the Agency for Healthcare Research and Quality send the draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. The draft evidence review is also posted on the USPSTF Web site for public comment. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the USPSTF Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from 23 December 2014 to 26 January 2015. The USPSTF reviewed all public comments received in response. The USPSTF acknowledges the current barriers to implementation of its recommendation, including the availability and affordability of ambulatory blood pressure monitoring (ABPM). In response, it revised the final recommendation to include home blood pressure monitoring (HBPM) as an alternative for confirming a diagnosis of hypertension when ABPM is not feasible. The USPSTF also provided more information on the implementation of diagnostic confirmation and industry standards for home blood pressure monitors.

Comparison with Guidelines from Other Groups

Recommendations for screening from the following groups were discussed: the Seventh Joint National Committee; the Eighth Joint National Committee; the American Heart Association; the American Academy of Family Physicians; and the American Congress of Obstetricians and Gynecologists.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found good evidence that screening for and treatment of high blood pressure in adults substantially reduces the incidence of cardiovascular events.

Potential Harms

Harms of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found good evidence that screening for and treatment of high blood pressure has few major harms.

Qualifying Statements

Qualifying Statements

- The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.
- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.
- Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality (AHRQ) or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of

their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the USPSTF will make all its products available through its Web site . The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size *Guide to Clinical Preventive Services*.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Foreign Language Translations

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for high blood pressure in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2015 Nov 17;163(10):778-86. [59 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Nov 17

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services (DHHS) or its agencies.

Source(s) of Funding

The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

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Former USPSTF member Michael LeFevre, MD, MSPH, also contributed to the development of this recommendation.

*Members of the USPSTF at the time this recommendation was finalized. For a list of current Task Force members, go to http://www.uspreventiveservicestaskforce.org/Page/Name/our-members .

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force (USPSTF) has an explicit policy concerning conflict of interest. All members disclose at each meeting if

they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. USPSTF members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

Disclosures

Authors have disclosed no conï¬,icts of interest. Authors followed the policy regarding conï¬,icts of interest described at http://www.uspreventiveservicestaskforce.org/Page/Name/methods-and-processes. Forms can be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M15-2223.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force (USPSTF). Screening for high blood pressure: U.S. Preventive Services Task Force reaffirmation recommendation statement. Ann Intern Med. 2007 Dec 4; 140(11): 783-7. [6 references].

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the Annals of Internal Medicine Web site.

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Piper MA, Evans CV, Burda BU, Margolis KL, O'Connor E, Smith N, Webber E, Perdue LA, Bigler KD, Whitlock EP. Screening for high blood pressure in adults: a systematic evidence review for the U.S. Preventive Services Task Force. Full report. Evidence Synthesis No. 121. AHRQ Publication No. 13-05194-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2014 Dec. 296 p.
- Piper MA, Evans CV, Burda BU, Margolis KL, O'Connor E, Whitlock EP. Diagnostic and predictive accuracy of blood pressure screening methods with consideration of rescreening intervals: a systematic review for the U.S. Preventive Services Task Force. Ann Intern Med. 2015 Feb 3;162(3):192-218.

Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

Background Articles:

- Barton MB et al. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. Ann Intern Med. 2007;147:123-127.
- Guirguis-Blake J et al. Current processes of the U.S. Preventive Services Task Force: refining evidence-based recommendation development. Ann Intern Med. 2007;147:117-122.
- Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147:871-875.

Available from the USPSTF Web site.

The following are also available:

- Screening for high blood pressure in adults: clinical summary. Rockville (MD): U.S. Preventive Services Task Force. 2015 Oct. 1 p. Available from the USPSTF Web site.
- A continuing medical education (CME) activity is available from the Annals of Internal Medicine Web site.
- The guide to clinical preventive services, 2014. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ), 2014. 144 p. Available from the AHRQ Web site.

The Electronic Preventive Services Selector (ePSS) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following are available:

- Screening for high blood pressure in adult. Understanding task force recommendations. Rockville (MD): U.S. Preventive Services Task Force; 2015 Oct. 4 p. Available from the U.S. Preventive Services Task Force (USPSTF) Web site.
- Screening for high blood pressure in adults: U.S. Preventive Services Task Force recommendation statement. Summaries for patients. Ann Intern Med. 2015 Nov 17;163(10):I-32. Available from the Annals of Internal Medicine Web site.
- Women: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP007-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at any age. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP006-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Women: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP002-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.
- Men: stay healthy at 50+. 2014 update. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 14-IP009-A. 2014 Mar. 5 p. Available in English and Spanish from the AHRQ Web site.

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the USPSTF and is available at www.healthfinder.gov.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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